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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,757	03/31/2004	Philip Derbeko	RADSA 21.075 (101120-0005)	5259
26304	7590	04/05/2006	EXAMINER	
KATTEN MUCHIN ROSENMAN LLP 575 MADISON AVENUE NEW YORK, NY 10022-2585			PATEL, KAUSHIKKUMAR M	
			ART UNIT	PAPER NUMBER
			2188	
DATE MAILED: 04/05/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/813,757	Applicant(s) DERBEKO, PHILIP	
	Examiner Kaushikkumar Patel	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/31/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on March 31, 2004 has considered by the examiner. The foreign reference patent documents have not considered, because the documents and/or the abstract of the documents have not submitted by the applicant.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 6-10, 12-15, 23-27, 29-32, 38, 40, 44, 46, 48, and 50 are rejected under 35 U.S.C. 112 second paragraph. (All line numbers are with reference to PG PUB # US 2005/0223180 A1 of present application)

As per claim 6, the term "the host" recites limitation in page 4, line 2 of the claim

6.

As per claim 7, the term "a primary task" recites limitation in line 2. It is not clear from the term "a primary task" refers to, a task from claim 1, or a new task?

As per claim 8, the term "a response message" recites limitation. It is not clear which "response message" it refers to.

As per claim 9, the terms "said data chunk", "the snapshot storage element" and "the production storage element" recite limitations.

As per claim 10, the term "said destination address" recites limitation.

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As per claim 12, the term "the host computer" recites limitation.

As per claim 13, the term "at least a primary task" recites limitation. It is not clear which primary task it refers to. Also the term "said host" recites limitation.

As per claim 14, the term "the changes table" recites limitation.

As per claim 15, the term "the production storage element" recites limitation.

There are insufficient antecedent basis for these limitations in the claims.

Claims 23-27, 29-32, 40, 44, 46, 48 and 50 are rejected due to similar limitations as described above with respect to claims 6-10 and 12-15.

Claims 11, 16-17, 28, 33-34, 45-46, 49 are rejected under 35 U.S.C. 112 second paragraph due to their dependencies on rejected claims above.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-8, 18-25, 35-37, 39-40, 44 and 48-49 are rejected under 35

U.S.C. 102(e) as being anticipated by Lam et al. (US 2005/0172092 A1) (Lam herein after).

As per claim 1, Lam teaches a method for enabling the execution of at least an I/O operation while providing a snapshot copy of a storage system (fig. 1, paragraph [0070]), said method comprises the steps of:

- a) performing on-line at least a primary task of said I/O operation, wherein said primary task is performed using a journal (paragraph [0052], taught as storage manager inserts the data item into staging device (journal);

- b) generating a response message ending the execution of said I/O operation (paragraph [0052], taught as storage manager transmits a write complete message to the client); and

- c) performing off-line secondary tasks of said I/O operation (paragraph [0053]).

As per claim 2, Lam teaches a host (paragraph [0031], a journal (a staging device, paragraph [0032]), a snapshot storage element, a production storage element (paragraph [0032], a primary and a backup storage device).

As per claims 3 and 4, Lam teaches that primary and backup devices with disks (paragraph [0032]) and virtual drives (paragraph [0042]), thus Lam inherently teaches storage elements with either physical storage elements or virtual volumes.

As per claim 5, Lam teaches staging device as non-volatile memory (paragraph [0035]).

As per claim 6, Lam teaches I/O operation is a write request initiated by host (paragraph [0052]).

As per claim 7, Lam teaches performing on-line at least a primary task comprises the steps of:

a) writing a data chunk included in said write request into said journal (paragraph [0052], taught as storage manager inserts the data item into the staging storage device); and,

b) saving a destination address designated in said write request in a changes table (paragraphs [0043] and [0052], taught as segment table stores metadata contained in write command, metadata contains information pertaining data identifying information).

As per claim 8, Lam teaches sending response message to said host (paragraph [0052]).

Claims 18-25 are also rejected under same rationales as applied to claims 1-8 above.

Claims 35-37, 39-41, 44, and 48-49 are also rejected under same rationales as applied to claims 1-8 and 18-25 above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9-11 and 26- 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam et al. (US 2005/0172092 A1) as applied to claims 1-8 and 18-25 above, and further in view of Armangau (US 6,434,681 B1).

As per claims 9 and 26, Lam teaches a method of performing off-line secondary task as explained above with respect to claims 1, 6 and 18, 25 above. Lam teaches copying modified data from staging storage device to primary volume (paragraph [0053]), Lam fails to teach checking of data chunk to see if data chunk is modified since last snapshot and if the data chunk is not modified than copying data chunk from production volume to snapshot volume. Armangau teaches checking of data chunk to see if data chunk is modified since last snapshot and if data chunk is not modified than copies data chunk from production volume to snapshot volume (see Armangau, column 2, lines 12-34).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Lam's storage system by teachings of Armangau to check the data chunk for modification and copying data from primary to snapshot volume by doing one can restore the previous data from snapshot volume if there is any fault or interruption in system and also one can create point-in-time backup copies.

As per claims 10, 11, 27 and 28, Lam teaches metadata of data item, which contains identification for assigned data block storage location (paragraph [0031]) and converting logical address to physical address (paragraph [0043]).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 12-17, 28-34 and 38, 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam et al. (US 2005/0172092 A1) and further in view of Shimozono et al. (US 2005/0025045 A1) and Serizawa et al. (US 2005/0076157 A1)

As per claims 12-17, Lam teaches a method to perform on-line a primary task of write operation as taught with regards to claims 1, 18 and 35 above, but fails to teach read operation. With respect to claim 12-17, the read operation is similar concept of journal working as a cache for host, where user stores data (modified with write request during snapshot process) temporarily in the journal and accesses the data (during read request) from the journal if data is in the journal (cache). It would have been obvious to one having ordinary skill in the art at the time of the invention would have used read request directed towards primary storage to staging storage device during snapshot process and sending the data to user read request if data is in the staging device and not waiting for completion of ongoing snapshot process and hence improving overall performance.

As per claim 14, Lam teaches storing metadata related to write request identifying the data block (paragraph [0052]). It would have been obvious to one having ordinary skill in the art at time of the invention to look for segment table to find if data chunk requested resides in the staging device, and if data is in the staging device than sending the data from location of staging device to host.

As per claim 15, It would have been obvious to one having ordinary skill in the art at the time of the invention would have accessed the data from primary (production) volume if data is not found in the staging device (cache) of Lam.

As per claims 16 and 17, Lam teaches write command with data identifier as explained above in claim 10 and performing logical to physical address conversion in case of virtual volume as per claim 11 above. It is inherent feature of read request to include source address of the data block to be read.

Claims 28-34 and 38, 42-47 is also rejected under same rationales as applied to claims 1-11, 18-27 and 35-37 above.

As per claim 38, Lam teaches storage devices being tapes and disks (paragraph [0004]). Lam fails to teach tape library and RAID devices, but uses of tape libraries and RAID are well known in the art and Examiner takes official note of that.

As per claim 42, Lam fails to teach storage controller, but he teaches storage manager to control data paths to and from host devices to storage disks and further teaches storage manager can be implemented using software and hardware (paragraph [0032]). It is well known in the art storage controllers performing data flow operations and virtualization operations.

As per claim 43, Lam fails to teach virtualization switch in storage area network (SAN). Shimozono and Serizawa teach use of virtualization switch (see fig. 1, abstract) in SAN to perform virtualization. It would have been obvious to one having ordinary skill in the art at the time of the invention to use virtualization switch as taught by Shimozono and Serizawa in system of Lam to improve system performance by redundancy in

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access paths to storage devices (See Shimozono, paragraphs [0009]-[0015]) and to provide dynamic storage configuration (see Serizawa, paragraphs [0007]-[0011]).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Keohane et al. (US 2004/0260894 A1) teaches performing point-in-time backup using differential data blocks and temporary storage.

Yamagami (US 2004/0268067 A1) teaches journal volume and creating point-in-time backup using primary and journal data.

Teoman et al. (US 6,463,509 B1) teaches large capacity non-volatile storage media used as user cache to perform faster I/O operations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


kmp

Kaushikkumar Patel
Examiner
Art Unit 2188


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SUPERVISORY PATENT EXAMINER
3/30/06